Name: Date:

Polynomial Factoring solution (version 604)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 84}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-48}}{2}$$

$$x = \frac{-6 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{-6 \pm 4\sqrt{3}\,i}{2}$$

$$x = -3 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 + 9i$ and $-5 + 7i$ in standard form $(a + bi)$.**

Solution

$$(-2 + 9i) \cdot (-5 + 7i)$$

$$10 - 14i - 45i + 63i^2$$

$$10 - 14i - 45i - 63$$

$$10 - 63 - 14i - 45i$$

$$-53 - 59i$$

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3. **Write function $f(x) = x^3 + x^2 - 24x + 36$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	1	-24	36
-6		-6	30	-36
	1	-5	6	0

$$f(x) = (x + 6)(x^2 - 5x + 6)$$

$$f(x) = (x + 6)(x - 3)(x - 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 5) \cdot (x + 1)^2 \cdot (x - 3)$$

Sketch a graph of polynomial $y = p(x)$.